



Apollo S10 SoM

Essential Instrument of High Performance Computing

Introduction



Designed for modular and scalable high-performance FPGA Prototyping and HPC solutions, Apollo S10 SoM packs unbeatable performance and energy efficiency in a tiny form factor and provides up to 90X performance increase over CPUs for critical workloads such as simulation acceleration, molecular dynamics, machine learning.



Apollo S10 SoM takes advantage of the latest Intel® Stratix® 10 SoC with 2800K logic elements to obtain speed and power breakthrough (with up to 70% lower power). Combining a number of high-end hardware interfaces such as high-capacity and high-bandwidth DDR4 SDRAM (up to 64GB), on-board USB-Blaster II, and FMC/FMC+ connectors for I/O expansion, the board delivers more than 2X the performance of previous generation development kits.



Apollo S10 SoM is also extensible. Apollo Carrier board is designed to assist our clients' development of Apollo S10 SoM. The carrier board features two ultra low-latency, straight connections 40Gbps QSFP+ module and Thunderbolt™ 3 for our clients to evaluate the I/O planned for their systems, and build their custom systems around it.

What You Can Do

- Prototyping
- High-speed communications
- Drive/motion control
- Digital signal processing
- AI and deep learning

Software Services

Apollo Developer Kit (module board + carrier board) supports OpenCL:

- Support Terasic-optimized OpenCL™ BSP version 18.1.

Version updates will be provided on Terasic website

As Intel® certified service provider for OpenCL services and development, Terasic also provides customized service to meet the exact needs of our clients

Customized Services

Hardware and Software Solution

- Terasic has a strong design expertise in FPGA hardware and software.
- Terasic creates FPGA-based products to meet our clients' specific requirements. We excel at delivering ready-to-use and highly optimized systems. Terasic rugged FPGA systems have been deployed in various extreme environments, such as Wall Street's zero-downtime data center and 5G base station in desert.

Consultancy Services

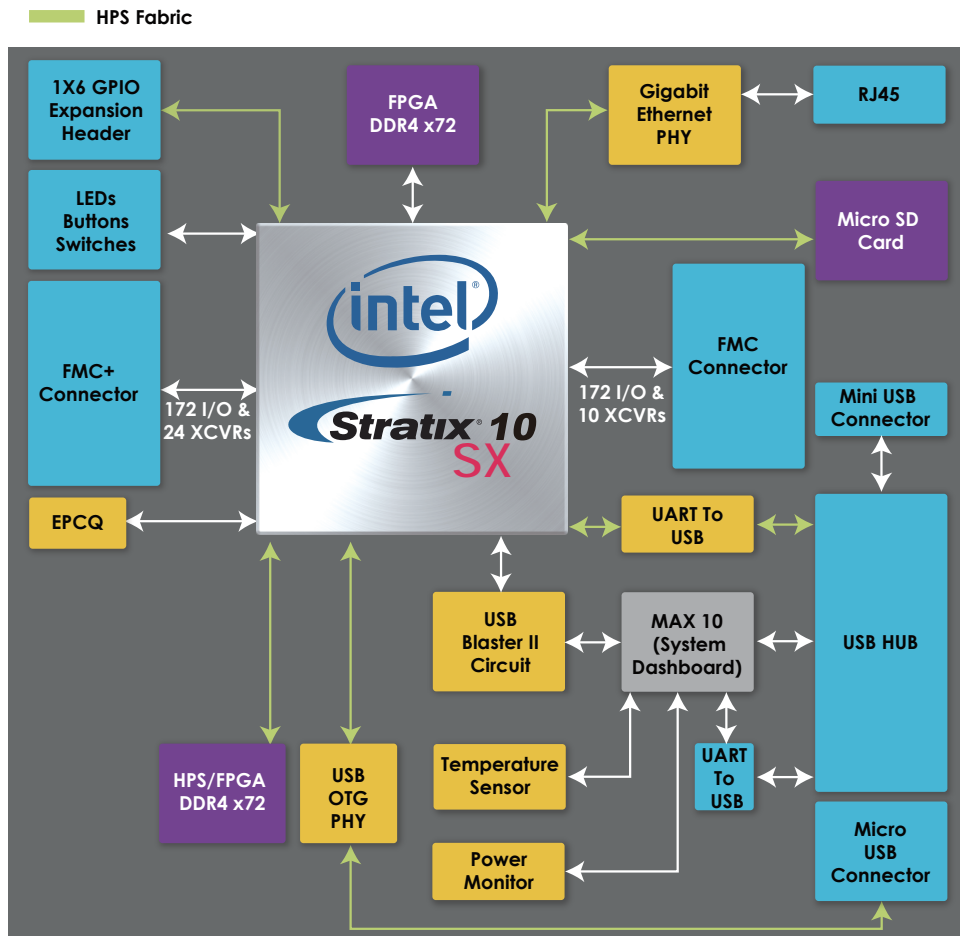
- At Terasic, we offer assistance to our clients in aspects such as porting, optimization and benchmarking of applications executed on Terasic FPGA boards. Our support includes software upgrade and OpenCL design services.



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Block Diagram



Major Specs and Interfaces

Apollo Developer Kit

Apollo Developer Kit includes Apollo S10 Module Board and Apollo Carrier Board. The carrier board is an I/O based board for developers to experience the peripherals of the module board.

Apollo S10 Module board



- Stratix® 10 SX FPGA with 2800K logic elements (Core Speed Grade: -2/ Transceiver Speed Grade : -1)
- On-board USB-Blaster II for programming Stratix® 10 and EPCQ/Micro SD card for booting device
- 2 independent banks of DDR4 on-board memory with error correction code (ECC), up to 32GB@1066MHz for each bank
- FMC+ and FMC connectors for interface expansion (Support 336 FPGA I/O and 34 high speed transceiver)

- Support USB 2.0 OTG, USB to UART and Gigabit PHY interface for HPS communication
- **Power and Thermals**
 - 80W TDP and 210W peak power
 - 55°C TLA
- **Board Size and Weight**
 - Dimensions: 125x133 mm
 - Weight : 1164 g (fan included)

Apollo Carrier board

- Provide 12V DC to Apollo S10 via SAMTEC 2x6 power connector
- PCIe Gen3 x4 via Thunderbolt 3 (Type-C connector)

- Two QSFP28 connectors (40G Ethernet)
- Support 2x20 GPIO Header and user LED / Button/Key